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REMARKS

In the Non-Final Office Action, Examiner Piziali rejected pending claims 1-18 on various grounds. The Applicant responds to each rejection as subsequently recited herein, and respectfully requests reconsideration and further examination of the present application under 37 CFR § 1.112:

- A. Examiner Piziali rejected pending claims 1-18 under 35 U.S.C. §112, ¶2 as being indefinite

The Applicant has amended claims 1, 2, 9, 10, 17 and 18 herein to delete the term "nonzero" from claims 1, 2, 9, 10, 17 and 18. Withdrawal of the rejection of claims 1, 2, 9, 10, 17 and 18 under 35 U.S.C. §112, ¶2 as being indefinite is therefore respectfully requested.

- B. Examiner Piziali rejected pending claims 1-7, 9-15, 17, and 18 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,677,705 to *Shimura* et al.

The Applicant has thoroughly considered Examiner Piziali's remarks concerning the patentability of claims 1-7, 9-15, 17 and 18 over *Shimura*. The Applicant has also thoroughly read *Shimura*. To warrant this anticipation rejection of claims 1-7, 9-15, 17 and 18, *Shimura* must show each and every limitation of independent claims 1 and 9 in as complete detail as is contained in independent claims 1 and 9. See, MPEP §2131. The Applicant respectfully traverse this anticipation rejection of independent claims 1 and 9, because *Shimura* fails to disclose and teaches away from "within which four elementary units of time one pulse each time has a first polarity which opposes a second polarity of the other pulses" as recited in independent claim 1, and "wherein, for each elementary unit of time, one pulse has a first polarity that opposes a second polarity of the other pulses" as recited in independent claim 9.

As to the traversal, Examiner Piziali asserts that *Shimura* illustrates the aforementioned limitations of independent claims 1 and 9 in FIG. 5 of *Shimura*.

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However, a proper understanding of Shimura reveals that *Shimura* in fact does not teach the aforementioned limitations of independent claims 1 and 9 in FIG. 5 of *Shimura* for a couple of reasons.

First, *Shimura* illustrates eight (8) Walsh functions in FIG. 5 of *Shimura*. This teaching by *Shimura* is analogous with the four (4) orthogonal functions (e.g., Walsh functions) illustrated in FIG. 4a of the present application, which is encompassed in independent claim 1 with the recitation of “wherein the mutually orthogonal signals are obtained from at least two types of orthogonal functions having four elementary units of time”, and is encompassed by independent claim 9 with the recitation of “wherein the *p* mutually orthogonal signals are obtained from at least two types of orthogonal functions having four elementary units of time”. As such, this teaching by *Shimura* is not directed to mutually orthogonal signals obtained from the eight (8) Walsh functions. Thus, *Shimura* fails to teach such mutually orthogonal signals obtained from the eight (8) Walsh functions “within which four elementary units of time one pulse each time has a first polarity which opposes a second polarity of the other pulses” as recited in independent claim 1, and “wherein, for each elementary unit of time, one pulse has a first polarity that opposes a second polarity of the other pulses” as recited in independent claim 9. These limitations of independent claims 1 and 9 are directed to the four (4) orthogonal signals illustrated in FIG. 4b of the present application that are obtained from the four (4) orthogonal functions illustrated in FIG. 4a of the present application.

Second, the teaching by *Shimura* as illustrated in FIG. 5 does not, for each elementary unit of time, having only one pulse with a first polarity that opposes the second polarity of the other pulses as evidenced by the following TABLE:

TIME (t)	FIRST POLARITY (+1)	SECOND POLARITY (-1)
1	$\emptyset(1) - \emptyset(8)$	None
2	$\emptyset(1) - \emptyset(4)$	$\emptyset(5) - \emptyset(8)$
3	$\emptyset(1), \emptyset(2), \emptyset(7), \emptyset(8)$	$\emptyset(3) - \emptyset(6)$
4	$\emptyset(1), \emptyset(2), \emptyset(5), \emptyset(6)$	$\emptyset(3), \emptyset(4), \emptyset(7), \emptyset(8)$
5	$\emptyset(1), \emptyset(4), \emptyset(5), \emptyset(8)$	$\emptyset(2), \emptyset(3), \emptyset(6), \emptyset(7)$
6	$\emptyset(1), \emptyset(4), \emptyset(6), \emptyset(7)$	$\emptyset(2), \emptyset(3), \emptyset(5), \emptyset(8)$
7	$\emptyset(1), \emptyset(3), \emptyset(6), \emptyset(8)$	$\emptyset(2), \emptyset(4), \emptyset(5), \emptyset(7)$
8	$\emptyset(1), \emptyset(3), \emptyset(5), \emptyset(7)$	$\emptyset(2), \emptyset(4), \emptyset(6), \emptyset(8)$

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To more particularly point out and distinctly claim the present invention over *Shimura*, the Applicant has amended independent claim 1 to recite "wherein the mutually orthogonal signals are pulses obtained from at least two types of orthogonal functions having four elementary units of time, within which four elementary units of time one pulse each time has a first polarity which opposes a second polarity of the other pulses", and amended claim 9 to recite "wherein the *p* mutually orthogonal signals are pulses obtained from at least two types of orthogonal functions having four elementary units of time."

Withdrawal of the rejection of independent claims 1 and 9 under 35 U.S.C. §102(b) as being anticipated by *Shimura* is therefore respectfully requested.

Claims 2-7, and 17 depend from independent claim 1. Therefore, dependent claims 2-7, and 17 include all of the elements and limitations of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claims 2-7, and 17 are allowable over *Shimura* for at least the same reason as set forth with respect to independent claim 1 being allowable over *Shimura*. Withdrawal of the rejection of dependent claims 2-7, and 17 under 35 U.S.C. §102(b) as being anticipated by *Shimura* is therefore respectfully requested.

Claims 10-15, and 18 depend from independent claim 9. Therefore, dependent claims 10-15, and 18 include all of the elements and limitations of independent claim 9. It is therefore respectfully submitted by the Applicant that dependent claims 10-15, and 18 are allowable over *Shimura* for at least the same reason as set forth with respect to independent claim 9 being allowable over *Shimura*. Withdrawal of the rejection of dependent claims 10-15, and 18 under 35 U.S.C. §102(b) as being anticipated by *Shimura* is therefore respectfully requested.

- C. Claims 8 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,677,705 to *Shimura* et al. in view of U.S. Patent No. 6,252,573 B1 to *Ito* et al.

Claim 8 depends from independent claim 1. Therefore, dependent claim 8 includes all of the elements and limitations of independent claim 1. It is therefore

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respectfully submitted by the Applicant that dependent claim 8 is allowable over *Shimura* in view of *Ito* for at least the same reason as set forth with respect to independent claim 1 being allowable over *Shimura*. Withdrawal of the rejection of dependent claim 8 under 35 U.S.C. §103(a) as being unpatentable over *Shimura* in view of *Ito* is therefore respectfully requested.

Claim 16 depends from independent claim 9. Therefore, dependent claim 16 includes all of the elements and limitations of independent claim 9. It is therefore respectfully submitted by the Applicant that dependent claim 16 is allowable over *Shimura* in view of *Ito* for at least the same reason as set forth with respect to independent claim 9 being allowable over *Shimura*. Withdrawal of the rejection of dependent claim 16 under 35 U.S.C. §103(a) as being unpatentable over *Shimura* in view of *Ito* is therefore respectfully requested.

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SUMMARY

Examiner Piziali's indefiniteness rejection of claims 1-16 have been obviated by the amendment herein of claims 1, 2, 9, 10, 17 and 18. Examiner Piziali's anticipation and obviousness rejections of claims 1-16 have been obviated by the remarks herein supporting an allowance of claims 1-16 over *Shimura*. The Applicant respectfully submits that claims 1-16 as listed herein fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112. In view of the foregoing, favorable consideration and early passage to issue of the present application is respectfully requested. If any points remain in issue that may best be resolved through a personal or telephonic interview, Examiner Piziali is respectfully requested to contact the undersigned at the telephone number listed below.

Dated: August 22, 2003

Respectfully submitted,
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